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THE UNIVERSITY OF ALBERTA

The Pooling of Unshared Information During Group Discussion

by

Brian R. Taylor



A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF Master of Arts

Department of Psychology

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..... Gary Wells

Supervisor

.....
.....

Date.. July.. 2 / 87

Abstract

Decisions by groups can benefit from the pooling of information during discussion, particularly when individual members have unshared information that is biased against the most favorable decision alternative. Pooling their unshared information would provide group members with an unbiased distribution of information for each alternative. There is some preliminary evidence, however, to suggest that group members do not effectively pool their information. In this study, there were four conditions in which group members individually were provided with partial information that biased their prediscussion preferences toward an inferior decision alternative. The extent of pooling was measured directly by scoring group discussions and indirectly by examining pre- versus postdiscussion shifts in preference. Discussion produced the least pooling when members were consensually biased away from the best alternative, whereas pooling of information was enhanced when group members had conflicting prediscussion preferences. It is argued that group discussions primarily centered around the initial preferences of group members such that an alternative that is not initially preferred by at least one member receives little discussion. It is suggested that this heuristic aids efficiency and usually results in good decisions except under certain distributions of unshared information such as those used in this study.

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I. Introduction

Groups play an important role in many aspects of our lives, making decisions related to government, business, or education. As such, social psychologists have long been interested in how an individual's behavior is influenced by others in a group. Some of the earliest contributions to our understanding of group dynamics was in the area of social facilitation -- the effects of an audience on the performance of an individual for a particular task. Triplett (1897) was the first to suggest that the presence of others facilitated the performance of an individual. He found that a bicycle racer generally had faster times for races in which other riders were also competing than for races in which the single rider attempted to beat an established course time. Further research generally supported the finding that the presence of others had an facilitating effect on an individual's behavior (Allport, 1920; Travis, 1925). There were other researchers, however, who showed that the presence of others had either no affect on an individual's behavior or had an adverse affect (Farnsworth, 1928; Pessin & Husband, 1933; Weston & English, 1926). It was not until Zajonc (1965) suggested that the presence of others has arousal consequences that these seemingly contradictory results were reconciled. Zajonc established that responses were facilitated by the presence of others for a well-learned task but the presence of others had an inhibitory effect on responses for a poorly learned task

(Zajonc & Sales, 1966).

Another aspect of group dynamics that has been well researched is the performance of groups on a task compared to the performance of individuals on the same task. Again, much of the research has indicated that for most tasks, groups tend to be superior to individuals. For example, for tasks involving problem solving, groups tend to produce superior solutions than do individuals (Husband, 1940; —Marquart, 1955; Shaw, 1932; Taylor & Faust, 1952; Watson, 1928). Likewise, on learning tasks, groups tend to learn to perform a task faster and make fewer errors than do individuals (Beaty & Shaw, 1965; Gurnee, 1937; Perlmutter & Montmollin, 1952; Yuker, 1955).

Thus, up to the mid-1960s, most of the research concerning group dynamics had generally shown groups to be more effective than individuals on tasks involving learning, problem solving, and on certain judgment-type tasks. Similarly, Whyte (1957) had argued that products of groups tended to be conservative and mediocre compared to products of individuals. It was surprising, therefore, when Stoner (1961) demonstrated that group decisions were riskier than the prediscussion decisions made by the individuals of those groups. Using hypothetical situations in which a person must choose between two courses of action that vary in the degree of riskiness and the degree of reward achieved by each path of action, Stoner found that groups recommended riskier paths of action than did individuals. This "risky shift"

phenomenon was replicated in several later studies (see Bem, Wallach, & Kogan, 1965; Wallach, Kogan, & Bem, 1962; Wallach, Kogan, & Bem, 1964). Further research, however, began to question the generality of this phenomenon. Some researchers demonstrated that groups, on occasion, advocated more cautious paths of action than did individuals (Moscovici & Zavalloni, 1969; Myers & Lamm, 1975). Thus, what had appeared to be a risky shift turned out to be a group polarization effect, in which the group served to polarize the prediscussion attitudes or opinions of the individual members of that group.

Vinokur and Burnstein (1974) suggested that one factor that was crucial to this polarization effect was the information that group members brought with them to discussion. On the one hand, they could have redundant information pertaining to the set of decision alternatives. This commonly held information is known as *shared* information. On the other hand, a group member can bring to discussion information that is unknown to the other members of the group. This information is said to be *unshared* information. Consider, for example, a situation in which a 4-person group has to decide among two decision alternatives, A or B. The total pool of information strongly favors Alternative A because A has eight favorable arguments and B only has four favorable arguments. Group members, however, only have partial (i.e., unshared) information on each alternative such that each member is aware of two pro-A

arguments and one pro-B argument. Thus, each group member enters discussion with unshared information that is mildly in favor of alternative A. During discussion, they become aware of more arguments in favor of both alternatives with more pro-A than pro-B arguments becoming available. Group discussion, therefore, serves to buttress the initial popular sentiment for A leading to a group polarization effect, in which group members prefer Alternative A even more than they did prior to discussion (Burnstein & Vinokur, 1977).

In their study of the group polarization phenomenon, Burnstein and Vinokur (1977) were primarily concerned with situations in which the balance of unshared information favored the best decision alternative. Consider, however, a situation in which the unshared information held by group members indicates that one decision alternative is best, when in fact complete knowledge of the information distribution would indicate that another decision alternative is better. Recall the previous example in which A had eight favorable arguments and B had four favorable arguments. This time, however, information is distributed such that group members have completely shared information for Alternative B but have unshared information among themselves with respect to Alternative A. Specifically, each group member only has two of the eight pro-A arguments but all of the pro-B arguments. In this case, each group member's initial preference would be in favor of Alternative

B but a pooling of information during discussion would make them aware that A, with its greater number of pro-arguments than B, is a better decision alternative. Thus, even when the initial preferences of all group members are biased away from the best decision alternative, the group discussion, ideally, could serve to counteract this bias through a pooling of the group's unshared information.

Although complete pooling of information could counteract any prediscussion biases, some researchers have argued that group discussion is often not efficient but rather it tends to be thematic and consensus confirming (see Fisher, 1980). For this reason, Stasser and Titus (1985) suggested that efficient pooling of information during group discussion would not occur under certain conditions. They proposed that the unshared information held by group members can create an information bias such that the partial sets of information do not accurately reflect the total distribution of information for each decision alternative. Returning to the previous example, the partial sets of information held by group members favors Alternative B but the total distribution of information clearly favors Alternative A. An information bias, in turn, results in a preference bias such that group members enter discussion preferring a decision alternative that they would not prefer if they were aware of the complete distribution of information for each decision alternative. The end result of these pregroup biases, according to Stasser and Titus, is to bias the group

discussion such that the "content of discussion tends to reflect but not to correct biases introduced by the distribution of information over group members before discussion" (1985, p. 1468).

To test their nonpooling hypothesis, Stasser and Titus (1985) had 4-person groups choose a suitable president of a student body from three fictional candidates, each possessing a number of positive, neutral, and negative attributes. In the *shared* condition, group members were presented with all the information on each candidate prior to discussion. That is, there was no unshared information in the groups prior to discussion. This information was distributed such that Candidate A had more positive and fewer neutral attributes than either Candidates B or C, but all three candidates possessed an equal number of negative attributes. Candidate A, therefore, represented the most suitable candidate. In the remaining two conditions, group members were provided with only a subset of the total pool of information; i.e., they possessed unshared information prior to discussion. In one unshared condition, the *consensus* condition, each group member was provided with a distribution of information suggesting B was the most suitable candidate. In the other unshared condition, the *conflict* condition, two group members were given information to bias their initial preferences toward B, whereas the other two group members were initially biased toward C. In both of these unshared conditions, however, a complete

pooling of information during discussion would indicate that A was the most suitable candidate.

Stasser and Titus (1985) predicted that groups in the consensus condition would not effectively pool their unshared information during discussion and, hence, the discussion would not serve to counteract the group bias. In the conflict condition, however, they hypothesized that conflicting preferences between group members would "promote more extensive and exhaustive sampling of the total available information" (1985, p. 1471). Stasser and Titus found that the majority of group members in the shared condition preferred A prior to discussion with a significant increase in postdiscussion preferences for A, whereas the majority of group members in the consensus condition preferred B prior to discussion with a significant increase in postdiscussion preferences for B. Thus, in both conditions there was a polarization effect from prediscussion to postdiscussion preferences (Burnstein & Vinokur, 1977). In the conflict condition, however, group members were split in prediscussion preferences between Candidates B and C, as expected, but group members remained divided between postdiscussion preferences for those two candidates.

From their results, Stasser and Titus (1985) concluded that groups do not pool their unshared information under conditions where group members are either consensually biased away from the optimal decision alternative or when

conflicting prediscussion preferences exist within the group. Stasser and Titus used these results to support what they called a *biased sampling model of group discussion*. Using this model to highlight the role that pregroup information plays during group discussion, they argued that (a) shared information is more likely to enter discussion than unshared information, and (b) that discussion is biased in favor of the current preferences of the group members. According to this model, group members rarely exhaust their pool of unshared information but rather contribute information to discussion that is consistent with their existing preferences.

A serious confounding in the Stasser and Titus (1985) study raises the question as to whether or not their results support their nonpooling hypothesis. They hypothesized that "members tend to recall and contribute arguments and facts that support their existent preferences....The content of discussion serves not only to give members new information but also to change the salience of old information" (1985, p. 1475). To test this hypothesis, Stasser and Titus measured the amount of information that group members could remember about the candidates before and after discussion. This meant that group members had to memorize their prediscussion information for the three candidates. In the shared condition, there were a total of 48 attributes (16 per candidate) that each group member had to remember and, in both unshared conditions, each group member had to

remember a total of 30 attributes (10 per candidate).

Faced with such an overwhelming amount of information to remember, a reasonable heuristic group members might use would be to simply memorize as much information as possible for a preferred candidate and spend less effort trying to memorize the information pertaining to nonpreferred candidates. Such a heuristic would allow group members in the consensus condition to recall a great deal of information about Candidate B but very little information about either A or C. Likewise, group members in the conflict condition would be able to recall a great deal of information about Candidates B or C but very little information about A. By placing such a constraint on group members, Stasser and Titus (1985) have not provided evidence for their nonpooling hypothesis. It may have been the case that group members wanted to completely pool their information during discussion but they could not recall enough information about nonpreferred candidates to shift their preferences. Thus, an apparent lack of pooling may have been the result of a selective encoding strategy rather than the result of inefficient group discussion.

It is odd that Stasser and Titus (1985) did not find evidence for a pooling of information in the conflict condition. They argued that conflicting prediscussion preferences do not promote a pooling of information because there was no increase from pre- to postdiscussion support for Candidate A. This conclusion, however, ignores the

possibility that there was partial pooling of information as a result of conflicting prediscussion preferences. Stasser and Titus found that groups were split in decision for either Candidates B or C. One possible reason for this random-decision process is that group members discovered conflicting preferences for Candidates B and C and randomly decided to choose either B or C. A more plausible explanation, however, would suggest that, at the least, there was a partial pooling of information for Candidates B and C. During discussion, group members pooled their information for these two candidates but discovered that there was no difference between them (both B and C each had four positive, eight neutral, and four negative attributes). Further, it may have been the case that group members wanted to pool their information for A also, but for reasons noted earlier, they could not recall enough information about A to realize that A was in fact a better alternative. Thus, faced with two equally viable alternatives, groups in the conflict condition chose at random to support either Candidates B or C. Therefore, it seems likely that conflicting prediscussion preferences may promote a pooling of information for preferred decision alternatives. Moreover, it is premature to conclude that conflicting prediscussion preferences do not promote an exhaustive pooling of unshared information during group discussion.

It would have been possible for Stasser and Titus (1985) to have detected either a partial or an exhaustive

pooling of information had they used direct measures of pooling. In their study, the pooling of information was inferred indirectly from shifts in prediscussion support for Candidates B or C toward postdiscussion support for Candidate A. Stasser and Titus argued that pooling did not occur in either the consensus or the conflict conditions because there was no increase in postdiscussion support for Candidate A. A better and more sensitive measure of pooling would have been to record the information that was mentioned for each candidate during group discussion. Not only would this permit an examination of the degree to which information was pooled for each candidate but it would also provide insight into different patterns of pooling (or nonpooling) across various unshared conditions. For instance, did the distribution of prediscussion preferences in the consensus condition lead to a different pattern of pooling than did the conflict condition? Were there different patterns of pooling for positive than for negative information and did these patterns vary for preferred versus nonpreferred alternatives? Was there any pooling of information for nonpreferred alternatives? As it stands, Stasser and Titus's study cannot provide answers to such questions.

It is clear, therefore, that the problems noted with the Stasser and Titus (1985) study makes it difficult to argue that there is substantive evidence for their nonpooling hypothesis. Furthermore, even if there is support

for their nonpooling hypothesis, it remains to be seen what conditions are necessary and sufficient for groups to pool their information such that groups can counteract an initial bias against the best decision alternative. This study was designed to correct for the problems noted in the Stasser and Titus study and to further explore the role that conflict may play in promoting the pooling of unshared information during group discussion. Of the five conditions in this study, three were conceptual replications of the Stasser and Titus study. Group members in the *shared* condition were provided with complete sets of information pertaining to three choice alternatives (A, B, & C). When group members entered discussion, therefore, there was no unshared information in the group. The distributions of information were created such that A was the best choice alternative, whereas B and C were equally inferior alternatives. In the *consensus* condition, the unshared information was distributed such that group members were consensually biased in favor of B, whereas the unshared information in the *conflict(B-C)* condition was distributed such that two group members had prediscussion preferences for B and the other two group members had prediscussion preferences for C.

The remaining two conditions in this study were designed to further test the notion that conflicting prediscussion preferences play an important role in the pooling of unshared information. In the *conflict(A-B)*

condition, conflicting prediscussion preferences were created between A and B in exactly the same way that conflicting prediscussion preferences were created between B and C in the conflict(B-C) condition. In the *tie(A-B)* condition, each group member was provided with unshared information indicating that A and B were equally good choices. The important difference between the *tie(A-B)* and the conflict conditions is that the former condition represents a "within-subjects" conflict, whereas the latter conditions represent a "between-subjects" conflict. It might be the case that when group members enter discussion with conflicting prediscussion preferences within themselves, they are more likely to pool their unshared information to resolve that conflict.

Both the conflict(A-B) and the *tie(A-B)* conditions allow for a test of the partial pooling hypothesis. That is, each condition represents a situation in which the pooling of information for preferred alternatives can be detected via shifts in pre- to postdiscussion preferences toward Alternative A. Recall that Stasser and Titus (1985) inferred that pooling of information did not occur in the conflict condition because there was no increase in postdiscussion support for Candidate A. This did not, however, rule out the possibility of partial pooling for Candidates B and C. If there is a partial pooling of information in the conflict(A-B) and the *tie(A-B)* conditions for Alternatives A and B, there should be an increase in postdiscussion support

for A.

There is a difference to the way in which unshared information is defined in this study and the way in which Stasser and Titus (1985) defined unshared information. For them, unshared information was information that was held by only one of the group's members, whereas shared information was known to all group members. In this study, however, unshared information was designated as information known to some but not all members of a group. Thus, unshared information could be information held by one, two, or three of the group's four members. In each of the four unshared conditions of this study, about 85% of the information for each alternative was unshared to one degree or another. It is true that the more group members who hold some information, the more likely that information is to be mentioned during discussion. It is also the case, however, that the less unshared some information is, the less impact it has on the group's discussion. That is, if 3 out of 4 group members are aware of some information, it has less influence than if 1 out of 4 group members are aware of that same information and it is mentioned during discussion. The effect of one of these factors, therefore, would negate the effect of the other factor.

There are other improvements that make this study a better test of the nonpooling hypothesis. First, to eliminate the memory confound noted in the Stasser and Titus (1985) study, group members were told during the

prediscussion phase of the experiment that they could take notes from the information they were provided with on the three alternatives. In this way, groups were not prevented from pooling their unshared information during discussion. An additional criticism of the Stasser and Titus (1985) study was the lack of any direct measures of information pooling. Although this study has conditions that allow for the detection of pooling via shifts in preferences, the information that was mentioned during group discussion was recorded. This permitted an examination of differential patterns of information pooling for alternatives across the four unshared conditions.

II. Method

A. Overview

Four-person groups were asked to imagine that they were serving on a committee for a large research corporation. Their task was to decide which of three houses this corporation should purchase. Group members, individually, were given 15 min to read over information on the three houses and to indicate a prediscussion preference for one of the houses. In one condition, group members were given complete information for each house, whereas in the remaining four conditions group members were provided with only a partial set of information for each house. Groups were then allowed a 15-min discussion to decide which house the corporation should purchase. After discussion, group members were asked to indicate a postdiscussion preference.

B. Subjects

Subjects were 316 University of Alberta students selected from the introductory psychology research pool. Participation partially fulfilled course requirements. They were randomly assigned to one of the five conditions in the experiment. There were 60 subjects each in the shared and consensus conditions, 64 subjects each in the conflict(A-B) and tie(A-B) conditions, and 68 subjects in the conflict(B-C) condition.

C. House Descriptions

There were a total of 14 attributes for each house. Although each house possessed the same 14 attributes, each attribute could have either a positive or negative valence. The three houses, therefore, differed in the valence combination of these 14 attributes such that a particular attribute may have been described as positive for one house, whereas the same attribute may have been described as negative for a different house. For example, a house could either be heated by a natural-gas furnace (positive valence) or an oil-burning furnace (negative valence). Likewise, a house could be located in a quiet neighborhood (positive valence) or located in a noisy neighborhood (negative valence).

Each of these 14 attributes pertained to one of two features in a house. An attribute could be a feature that made a house inexpensive (positive) or expensive (negative) for the corporation to maintain over a long period of time, or an attribute could be a feature that made the house attractive and comfortable (positive) or unattractive and uncomfortable (negative). To prevent group members from idiosyncratically interpreting an attribute as positive when it was intended to be negative or negative when it was intended to be positive (e.g., interpreting a noisy neighborhood as somehow positive or a gas-burning furnace as somehow negative), they were reminded that they were selecting features of a house for the corporation and not

selecting features of a house that they themselves might purchase (see Appendices A, B, and C for a complete description of each house). Specifying what was negative and what was positive about each house eliminated the need for pretesting the valence of each attribute.

D. Distributions of Information

The distributions of information for each house across the five conditions are displayed in Table 1. In the shared condition, group members were provided with complete information for the three houses so there was no unshared information. From Table 1, it can be seen that House A had eight positive and six negative attributes, whereas Houses B and C each had six positive and eight negative attributes. House A, therefore, represented the best overall decision because it possessed fewer negative and more positive attributes than either House B or House C.

In the four unshared information conditions, information was distributed such that each group member received only a subset of the total pool of information. In the consensus condition, each group member received five positive and three negative attributes for House B but only three positive and five negative attributes each for Houses A and C. In the conflict(B-C) condition, two group members were given five positive and three negative attributes for House B and only three positive and five negative attributes for Houses A and C, whereas the other two group members were

Table 1

Distributions of Information

Condition Shared	Houses		
	A	B	C
+	8	6	6
-	6	8	8
Consensus			
+	3	5	3
-	5	3	5
Conflict(B-C)			
+	3	5 [3]	3 [5]
-	5	3 [5]	5 [3]
Conflict(A-B)			
+	5 [3]	3 [5]	3
-	3 [5]	5 [3]	5
Tie(A-B)			
+	5	5	3
-	3	3	5

Note. In both conflict conditions, two group members received the information distributions represented in brackets and the other two members received the nonbracketed information distributions.

given five positive and three negative attributes for House C and only three positive and five negative attributes for Houses A and B. In the conflict(A-B), a similar distribution scheme was utilized, but conflicting preferences within the group were created between Houses A and B. Finally, in the tie(A-B) condition, group members were each provided with unshared information indicating that Houses A and B were equally attractive alternatives. This was accomplished by providing each group member with five positive and three negative attributes for both Houses A and B and only three positive and five negative attributes for House C.

It is important to note that although individual group members possessed only a subset of the total pool of information in the four unshared conditions, if group members were to pool their information for the three alternatives in a perfectly optimal way, they would arrive at an information distribution identical to that which existed in the shared condition. That is, a pooling of information would indicate to group members that A was the best overall choice regardless of prediscussion preferences.

E. Procedure

All materials provided to group members were identical across the five conditions, with the exception of house descriptions which varied according to experimental condition. At the beginning of an experimental session, group members were randomly assigned to four separate

cubicles with a booklet containing the following materials: (a) instructions, (b) a letter from the corporation's chairman, (c) three separate sheets, each describing one of the houses, (d) a sheet for making notes, and (e) a sheet for indicating a prediscussion preference. Group members were told that they had 15 min to read over the information in the booklet, make notes if they wanted to, and indicate a prediscussion preference (see Appendix D for a copy of the instructions; see Appendix E for a copy of the chairman's letter).

Group members first read the instructions which asked them to imagine that they were one of four persons serving on a committee that was directly responsible to the chairman of a large research corporation. This corporation had recently decided to purchase a house where visiting personnel, working with the corporation for several weeks at a time, could stay. The committee's task was to find and purchase a house that most closely matched the corporation's requirements. Further, they were asked to imagine that their group had found three houses. However, committee members had gone out *separately* to examine these houses. It was explained to group members, therefore, that there were two reasons for the group discussion. The first reason was to ensure that all group members agreed as to which house the company should purchase. Second, a committee member may have noticed (or missed) features of a house that others on the committee may have missed (or noticed). In this way, group

members were alerted to the possibility that others in the group may have additional information on the houses and, thus, they were encouraged to pool their respective information during discussion. This was similar to the manner in which Stasser and Titus (1985) alerted their subjects to the possibility of unshared information.

Group members next read a letter from the chairman of the corporation (both the chairman and the corporation were fictional), which reiterated the group's task. The chairman also explained that the corporation was concerned mainly with two features in any house that it might eventually purchase. The chairman's letter provided a couple of examples of both these features but the letter also stressed that these were only guidelines for the committee to follow.

When the prediscussion phase was over, the experimenter brought groups into a common area for discussion. The experimenter told groups that they had 15 min to decide which of the three houses the company should purchase. They were also told that if they reached a decision before 15 min, they could inform the experimenter of their decision. During discussion, the experimenter sat off to one side with a list of all the positive and negative attributes associated with each house. If a group member specifically mentioned an attribute for a particular house, that attribute for that house was checked off the list. Thus, at the end of discussion there was an accurate record of which attributes were mentioned during group discussion and which

attributes remained unmentioned. .

After the experimenter recorded their decision, group members were each given another preference rating sheet and asked to indicate a postdiscussion preference for one of the houses. They were then debriefed.

III. Results

A. Prediscussion Preferences

The distributions of prediscussion preferences for the three houses across the five conditions are shown in Table 2. By obtaining preference ratings prior to discussion, it was possible to check whether or not the manipulations of prediscussion information were successful. It was expected that when group members were provided with complete information on each house, they would have a preference for House A. Table 2 indicates that 82% of group members in the shared condition indicated a preference for A, whereas 19% of group members indicated a preference for B and C combined, $\chi^2(1, N = 60) = 24.07, p < .01$.

In the consensus condition, it was expected that the distribution of unshared information would bias all members of a given group toward House B. Table 2 indicates that 92% of group members in the consensus condition indicated a preference for B, whereas only 8% of group members indicated a preference for the A and C combined, $\chi^2(1, N = 60) = 41.67, p < .01$.

The distributions of unshared information in the two conflict conditions were arranged such that two group members would prefer one alternative, whereas the other two group members would prefer a different alternative. In the conflict(B-C) condition, it was expected that prediscussion preferences would be split between Houses B and C. Most

group members in this condition preferred either B or C and only a small proportion of group members indicated a prediscussion preference for A. A chi-square test of the difference between preferences for Houses B and C combined to House A was significant, $\chi^2(1, N = 68) = 60.24, p < .01$. Moreover, of the 98% of group members indicating a preference for either B or C, 49% preferred B and 49% preferred C, $\chi^2(1, N = 66) = 0$.

In the conflict(A-B) condition, it was expected that prediscussion preferences would be split between Houses A and B. Most group members preferred either A or B and only a small proportion preferred C. A chi-square test of the difference in preferences for Houses A and B combined to House C was significant, $\chi^2(1, N = 64) = 60.06, p < .01$. Moreover, of the 98% of group members indicating a preference for either A or B, 53% preferred A and 45% preferred B, $\chi^2(1, N = 63) = 0.40$.

In the tie(A-B) condition, it was expected that the distributions of information would create conflicting prediscussion preferences between Houses A and B within each group member. Although no group member preferred House C in this condition, 63% of group members preferred A and 38% of group members preferred B, $\chi^2(1, N = 64) = 4.00, p < .05$.

Table 2

Distributions of Prediscussion Preferences

Condition	Houses			n
	A	B	C	
Shared	49 (82%)	7 (12%)	4 (7%)	60
Consensus	3 (5%)	55 (92%)	2 (3%)	60
Conflict(B-C)	2 (3%)	33 (49%)	33 (49%)	68
Conflict(A-B)	34 (53%)	29 (45%)	1 (2%)	64
Tie(A-B)	40 (63%)	24 (38%)	0 (0%)	64

Note. The fourth column of numbers represents the total number of group members in each condition.

B. Postdiscussion Preferences

The distributions of postdiscussion preferences for the three houses across the five conditions are shown in Table 3. It can be seen from Table 3 that 92% of group members in the shared condition preferred A and only 8% of group members preferred either B or C, $\chi^2(1, N = 60) = 41.67, p < .01$. In the consensus condition, however, 93% of group members preferred B and only 7% preferred A and C combined, $\chi^2(1, N = 60) = 45.07, p < .01$.

The pattern of postdiscussion preferences were similar in both the conflict(A-B) and tie(A-B) conditions. In the conflict(A-B) condition, 72% preferred A and only 28% preferred either B or C, $\chi^2(1, N = 64) = 12.25, p < .01$. Likewise, in the tie(A-B) condition, 84% preferred A and only 16% preferred either B or C, $\chi^2(1, N = 64) = 30.25, p < .01$.

Finally, there were no differences in postdiscussion preferences for the three houses in the conflict(B-C) condition. In this condition, 31% of group members preferred House A, 42% preferred House B, and 28% preferred House C. A chi-square test of the differences in preferences for the three houses was not significant, $\chi^2(2, N = 68) = 2.48, p < .30$.

Table 3

Distributions of Postdiscussion Preferences

Condition	Houses			n
	A	B	C	
Shared	55 (92%)	5 (8%)	0 (0%)	60
Consensus	4 (7%)	56 (93%)	0 (0%)	60
Conflict(B-C)	21 (31%)	29 (42%)	19 (28%)	68
Conflict(A-B)	46 (72%)	18 (28%)	0 (0%)	64
Tie(A-B)	54 (84%)	10 (16%)	0 (0%)	64

Note. The fourth column of numbers represents the total number of group members in each condition.

C. Pooling of Information During Discussion

The mean proportions of positive and negative information discussed for each house across the five conditions are shown in Table 4. Proportions were the necessary unit of analysis because there was more positive and less negative information for House A than for either Houses B and C (see shared condition distributions in Table 1). For each group, therefore, the total number of positive attributes for A that were mentioned were divided by 8 and the total number of negative attributes mentioned were divided by 6. Likewise, the discussion scores of positive attributes for B and C were divided by 6, whereas the discussion scores of negative attributes were divided by 8. Thus, the proportions could range from 0 (no pooling of information) to 1 (complete pooling of information).

The group discussion data were first analyzed in a 5 (Experimental Condition) $\times$ 3 (House A,B,C) $\times$ 2 (Attribute Valence) split-plot factorial analysis of variance, in which Condition was a between-subjects factor but House and Valence were within-subjects factors. All main effects and interactions were significant with the exception of the main effect for Valence and the double interaction for Condition $\times$ Valence. Importantly, however, the triple interaction for Condition $\times$ House $\times$ Valence was significant, $F(8,148) = 2.079$, $p < .05$. Because this triple interaction was significant, further analyses of simple main effects plus interactions of the House and Valence factors at each level

Table 4

Mean Proportion of House Attributes Pooled During Discussion

		A	Houses B	C
Condition Shared	+	.517	.311	.211
	-	.467	.275	.283
Consensus	+	.208	.622	.100
	-	.322	.375	.208
Conflict(B-C)	+	.500	.824	.824
	-	.608	.838	.853
Conflict(A-B)	+	.766	.781	.260
	-	.812	.703	.250
Tie(A-B)	+	.648	.604	.156
	-	.646	.484	.250

of the Condition factor were warranted.

Within the shared condition, a test of simple main effects plus interactions indicated a simple main effect for House, $F(2,148) = 11.906$, $p < .01$, but no simple main effect for Valence or an interaction. Table 4 shows that, overall, there was more pooling of information for House A ($M = .492$) than for either Houses B or C ($M_s = .293$ and $.247$ respectively). A post hoc Scheffe's test contrasting the mean proportion of pooling for A to the mean proportions of pooling for B and C was significant, $F(2,148) = 11.596$, $p < .01$.

In the consensus condition, there was a main effect for House, $F(2,148) = 21.812$, $p < .01$, but no main effect for Valence. The House x Valence interaction, however, was significant, $F(2,148) = 22.172$, $p < .01$. As Table 4 indicates, there was more pooling of the positive information for House B ($M = .622$) than there was pooling of positive and negative information for the three houses ($M = .243$). A post hoc Scheffe's test contrasting the mean proportion of pooling of positive information for House B to the remaining five mean proportions was significant, $F(5,148) = 32.707$, $p < .01$.

Group discussion in the conflict(B-C) condition was characterized by a fair amount of pooling for all three decision alternatives. A test of simple main effects plus interactions indicated a main effect for House, $F(2,148) = 21.012$, $p < .01$, but no simple main effect for Valence or an

interaction. Table 4 shows that the majority of information for Houses B and C was pooled during discussion, ($M_s = .831$ and $.839$ respectively) and somewhat more than half of the information for House A was pooled during discussion ($M = .554$). A post hoc Scheffe's test contrasting the mean proportions of pooling for B and C to A was significant, $F(2,148) = 19.925, p < .01$.

Within the conflict(A-B) condition, a test of simple main effects plus interactions indicated a main effect for House, $F(2,148) = 66.953, p < .01$, but no main effect for Valence or an interaction. As Table 4 shows, most of the information for Houses A and B was pooled during discussion, ($M_s = .789$ and $.742$ respectively), but there was little pooling of information for House C ($M = .255$). A post hoc Scheffe's test contrasting the mean proportions of pooling for A and B to the mean proportion of pooling for C was significant, $F(2,148) = 65.408, p < .01$.

The pattern of information pooling in the tie(A-B) condition was similar to the pattern in the conflict(A-B) condition. A test of the simple main effects plus interactions indicated a main effect for House, $F(2,148) = 53.965, p < .01$, but no main effect for Valence or an interaction. Table 4 shows that, overall, there was more pooling for Houses A and B ($M_s = .647$ and $.544$ respectively) but there was very little pooling of information for House C ($M = .203$). A post hoc Scheffe's test contrasting the mean proportions of pooling for A and B to the mean proportion of

pooling for C was significant, $F(2,148) = 38.665, p < .01$.

Another simple main effects plus interaction of interest was the Condition x Valence factors for House A. This analysis revealed a simple main effect for Condition, $F(4,222) = 33.367, p < .01$, but no simple main effect for Valence or an interaction. A Neuman-Keuls analysis on the discussion means for Condition revealed three clusters. The conflict(A-B) and tie(A-B) means formed one cluster ($M_s = .789$ and $.647$ respectively) and the conflict(B-C) and shared condition means constituted the second cluster ($M_s = .554$ and $.492$ respectively). The consensus mean ($M = .265$) constituted the third cluster.

D. Group Decisions

The pattern of results for the group decisions were similar to the pattern of postdiscussion preferences across the five conditions. Table 5 indicates that the majority of groups decided in favor of A in the shared condition with only 1 out of 15 groups deciding in favor of B. A chi-square test of the difference in group decisions for House A compared to decisions for Houses B and C combined was significant, $\chi^2(1, N = 15) = 11.27, p < .01$.

In the consensus condition, however, 93% of groups decided in favor of B with only 1 out of 15 groups deciding in favor of A. A chi-square test of the difference in group decisions for House B compared to decisions for Houses A or C combined was significant, $\chi^2(1, N = 15) = 11.27, p < .01$.

Table 5

Distributions of Group Decisions

Condition	Houses			n
	A	B	C	
Shared	14 (93%)	1 (7%)	0 (0%)	15
Consensus	1 (7%)	14 (93%)	0 (0%)	15
Conflict(B-C)	5 (29%)	7 (41%)	5 (29%)	17
Conflict(A-B)	12 (75%)	4 (25%)	0 (0%)	16
Tie(A-B)	13 (81%)	3 (19%)	0 (0%)	16

Note. The fourth column of numbers represents the total number of groups in each condition.

In the conflict(A-B) condition, 75% of groups decided in favor of A compared to 25% deciding in favor of B, $\chi^2(1, N = 16) = 4.00, p < .01$. Likewise, in the tie(A-B) condition, 81% of groups decided in favor of A compared to 19% deciding in favor of B, $\chi^2(1, N = 16) = 6.25, p < .01$.

Finally, similar to the postdiscussion preferences among group members in the conflict(B-C) condition, there were no significant differences among group decisions for the three houses. Of the 17 groups in this condition, 29% each decided in favor of A or C and 41% decided in favor of B, $\chi^2(2, N = 17) = 0.47$.

E. Shifts in Preferences Toward House A

Another measure of the effectiveness of each unshared condition for promoting a pooling of information was to examine the number of group members who shifted their prediscussion preferences from Houses B or C toward postdiscussion preferences for House A. In each condition, however, there was a different number of group members who potentially could shift their preferences to A. For example, there were 66 group members who could shift their preferences to A in the consensus condition but only 30 group members who could shift their preferences to A in the conflict(A-B) condition. Thus, it was necessary to compare the number of group members who *did shift* their prediscussion preferences for B or C toward A with the number of group members who *could shift* their prediscussion

preferences for B or C toward A. Table 6 lists the proportions of group members who shifted their preferences to A. For example, of the 24 group members in the tie(A-B) condition who indicated a prediscussion preference for either Houses B or C, 14 group members (or 58%) indicated a postdiscussion preference for House A.

A z-test for the difference in sample proportions was used to test whether the proportions listed in Table 6 were significantly different from each other. The proportion of group members who shifted in the conflict(A-B) condition did not differ significantly from the proportion of group members who shifted in the tie(A-B) condition (40% vs. 58% respectively), $z = 1.32$, $p < .10$. However, the proportion of group members who shifted in the conflict(B-C) condition was significantly lower than the proportion of group members who shifted in the tie(A-B) condition (29% vs. 58% respectively), $z = 2.52$, $p < .01$. The proportion of group members who shifted in the conflict(B-C) condition did not differ significantly from the proportion of group members who shifted in the conflict(A-B) condition (29% vs. 40% respectively), $z = 1.07$, $p < .15$. Finally, only a small proportion of group members shifted their preferences in the consensus condition. The proportion of group members in the consensus condition who shifted was significantly lower than the proportion of group members who shifted in the conflict(B-C) condition (2% vs. 29% respectively), $z = 4.07$, $p < .01$.

Table 6

Shifts in Postdiscussion Preferences Toward House A

	Number of members who could shift	Number of members who shifted	Proportion of shifts
Condition Shared	11	6	.55
Consensus	57	1	.02
Conflict(B-C)	66	19	.29
Conflict(A-B)	30	12	.40
Tie(A-B)	24	14	.58

IV. Discussion

This research began with an attempt to test Stasser and Titus's (1985) hypothesis that groups do not effectively pool their unshared information in order to counteract biases introduced by the distributions of that unshared information. There were two major reasons for carrying out this research; first, to correct problems and shortcomings to their study and, second, to further explore the role that conflicting prediscussion preferences play in promoting the pooling of unshared information.

The shared condition was the necessary control condition because it provided an indication of group members' preferences when they had complete information for each decision alternative. Recall that the distributions of positive and negative information were created such that A was the best overall alternative. It is clear from the pattern of pre- and postdiscussion preferences as well as group decisions in the shared condition that group members overwhelmingly preferred House A. The pattern of discussion for that condition indicated that, although groups discussed all three alternatives, most of the discussion centered on House A.

The four unshared-information conditions in this study provided group members with only a partial subset of the total available information on each decision alternative and, in many cases, they were biased away from the best alternative. However, even though group members were never

exposed to the complete distribution of information, an exhaustive pooling of information during discussion could have provided them with the same distribution of information that was given to groups in the shared condition. It was reasonable to expect, therefore, that those group members initially biased away from House A would shift their preference toward that decision alternative if exhaustive pooling occurred during discussion.

The consensus condition represented the worst condition in terms of potential for information pooling during discussion. That is, not only was there no prediscussion support for the best alternative (A) but there also were no conflicting prediscussion preferences within the group. This was a situation, therefore, in which the decision of the group was potentially superior to the decision of any individual member of the group. The distributions of prediscussion information had the intended effect of consensually biasing group members toward B but a lack of exhaustive pooling of information resulted in group members still believing after discussion that B was the best overall alternative. The pattern of group discussion would suggest that groups engaged in a confirmation process in which group members justified, to each other, their initial preference for House B. During discussion, groups tended to pool their positive information for House B and the little amount of information that was pooled for the two nonpreferred alternatives was more likely to be negative information

rather than positive information.

The three conditions that represented some form of conflict demonstrated the potential of conflicting prediscussion preferences to increase the level of information pooling during discussion. In the conflict(B-C), conflict(A-B), and the tie(A-B) conditions, at least three-quarters of the positive and negative information was pooled for the two preferred alternatives. However, the patterns of pre- and postdiscussion preferences, group decisions, and the group discussion data also make it clear that conflicting prediscussion preferences do not promote an exhaustive pooling of information for all decision alternatives. In all three conflict conditions the nonpreferred alternatives, for the most part, were not discussed by groups although there was more pooling of information for the nonpreferred alternative (A) in the conflict(B-C) condition than there was pooling for the nonpreferred alternative (C) in the conflict(A-B) and tie(A-B) conditions. Thus, it appears that two conditions must be met before groups can counteract biases in prediscussion preferences against the best alternative; first, there must be conflicting prediscussion preferences in the group (either between or within group members) and, second, some group members must have an initial preference for the best decision alternative.

The concepts of interindividual consensus and intraindividual certainty have been discussed within the

group literature (Davis, 1973, 1980; Stasser & Davis, 1981) and are relevant to this study. Intraindividual certainty refers to an individual's strength of belief in a preference; whereas interindividual consensus refers to the distribution of preferences among individuals of a group. As Stasser and Davis (1981) noted, "social comparison theory (Festinger, 1954) suggests that one function of group interaction is to validate one's opinions and that individuals actively pursue such validation in the absence of an objective criterion by which to evaluate their opinions" (p. 527). In the context of this study, group members in the consensus condition may have perceived that there was no need to pool their information for nonpreferred alternatives because each group member was already certain about their prediscussion preference (high intraindividual certainty) and the group itself was consensual as to which alternative they preferred (high interindividual consensus).

In the conflict conditions, however, there may have been a high level of intraindividual certainty but there was a low level of consensus. Likewise, there may have been high interindividual consensus among group members in the tie(A-B) condition but there was a low level of intraindividual certainty. The group discussion in these conditions represented an attempt by group members to validate their prediscussion preference to other group members and, in doing so, there was a pooling of unshared information for preferred alternatives.

It is interesting that there was more than twice the amount of pooling for the nonpreferred alternative in the conflict(B-C) condition than there was pooling for the nonpreferred alternative in the tie(A-B) or conflict(A-B) conditions. This increase in pooling for A in the conflict(B-C) condition relative to the pooling for C in both the conflict(A-B) and tie(A-B) conditions is likely the result of the way the information was distributed in the shared condition for the three houses. Note that in the shared condition, the complete distribution of information indicates that B and C are identical with respect to the total number of positive and negative attributes. The conflicting prediscussion preferences in the conflict(B-C) condition led group members to readily pool their information for Houses B and C. This pooling process, in turn, probably resulted in a "discussion stalemate" in the sense that two group members could not convince the other two group members that their alternative represented a better choice. In order to break this stalemate, groups chose to discuss House A. The resulting discussion about A quickly led group members to realize that A in fact was a superior alternative to either B or C. Consider, however, the situation that existed in both the conflict(A-B) and tie(A-B) conditions, in which there were conflicting preferences for A and B. The conflict in these groups caused a pooling of information for A and B but, in this case, the two group members who supported A were able to convince the

two group members who supported B that A in fact was a superior alternative. Thus, group members probably saw no reason to discuss House C. Therefore, the results from the conflict(B-C) condition suggest one possible factor that can facilitate more extensive sampling of information. That is, if a pooling of information leads groups to a stalemate in discussion, groups may attempt to break that deadlock by considering undiscussed alternatives.

It is odd that there was not an exhaustive pooling of information for preferred and nonpreferred decision alternatives given that group members were provided with cues to pool *all* their information. First, as noted earlier, groups had complete information for the three alternatives during discussion because group members were permitted to take their individual sets of information with them into discussion. It is plausible, of course, that group members took notes for preferred alternatives only. However, only 8% of the 316 group members in the study made either notes on preferred alternatives alone or no notes at all. Thus, had groups wanted to pool their information, they had full access to the complete distribution of information for all three decision alternatives.

Second, the instructions pointed out to group members that others in the group may have information that they themselves did not have and vice versa. In fact, they were told that one of the reasons for group discussion was to make sure that everyone in the group had the same

information on each house. Related to the second point, group members in all four unshared conditions had to have been aware of the fact that others in the group had some new information on each house. In all the unshared conditions, 85% of the information for each house was unshared. Thus, even in the consensus condition in which there was the least amount of pooling, group members must have realized that others had novel information, even for House B.

Finally, a third cue concerns the pool of attributes for the three houses. The fictional candidates that Stasser and Titus (1985) used each had a separate pool of positive, negative, and neutral attributes such that the attributes of Candidate A did not correspond to any of the attributes for Candidate B and so on. In this study, there were only a total of 14 attributes and each house possessed some valence combination of these 14 attributes. Thus, each house had a furnace, for example, but one house could have an oil-burning furnace and a different house could have a gas-burning furnace. In any of the unshared conditions, therefore, a group member might know what kind of furnace Houses A and B had but not know what kind of furnace House C had. It would seem that missing information such as this would facilitate a greater amount of pooling for all possible decision alternatives.

A possible reason why group members did not pool their unshared information more effectively may have been due to the manner in which groups started discussion. Many groups

began their discussion by each group member stating their prediscussion preference. Once they had discovered the distribution of these preferences, groups would eliminate nonpreferred alternatives from further discussion. Such a heuristic would serve to help groups engage in an efficient and time-saving discussion. It might be that with only 15 min to reach a decision, they considered this strategy as one method to help them attain that goal. It is interesting, however, that most groups were able to reach a decision well within the 15-min time limit; in fact, many groups made a decision in about 10 min. Thus, it was not for a lack of time that groups did not consider nonpreferred alternatives.

The data from this study appear to support one aspect of the biased sampling model but do not support other aspects of the model. Recall that Stasser and Titus (1985) suggested that discussion is biased in favor of the current preferences of group members. The group discussion data clearly support this notion. The greatest proportion of information pooling occurred for houses for which there was prediscussion support. However, Stasser and Titus also argued that "unshared information will tend to be omitted from discussion and, therefore, will have little impact on members' preferences during group discussion" (1985, p. 1476). This study indicated that unshared information was pooled during discussion and, under conditions of conflicting prediscussion preferences, unshared information impacted on group decisions and postdiscussion preferences.

The consensus condition also promoted pooling of information, although there was less pooling than in the conflict conditions. The unshared information that was pooled in the consensus condition, however, did not impact on group decisions and postdiscussion preferences. Thus, the impact of unshared information appears to depend on the distribution of prediscussion preferences. When there are conflicting prediscussion preferences, groups are more sensitive to the unshared information and are more likely to pool in order to make a decision. When they are consensually biased in favor of one decision alternative, however, unshared information for nonpreferred alternatives has little impact.

Thus, this study demonstrated that there is support for the notion that groups do not pool their unshared information effectively during group discussion. However, this study also showed that conflict can increase the pooling of information and can be an effective way for groups to counteract prediscussion biases. Furthermore, the tie(A-B) condition makes it clear that this conflict can be "within" group members and not strictly between group members. This supports one aspect of Fisher's (1980) four-phase model of decision emergence in which he noted that one of the early stages of group decision making involves group conflict. He argued that in the conflict phase, "members...provide data and evidence to substantiate their beliefs and engage in full-fledged debate with other

members" (1980, p. 146). From the patterns of group discussion data, it is clear that group members were actively supporting their preferences and the provision of data and evidence was the pooling of unshared information.

The lack of exhaustive pooling in the unshared conditions can be regarded as another example of the failure to consider disconfirming evidence. Within the information processing literature, several researchers have demonstrated that people tend to be poor at seeking out and utilizing negative or disconfirming information (see Snyder & Swann, 1978; Wason, 1960, 1968; Wason & Johnson-Laird, 1972). For example, Wason (1960) gave subjects three numbers (e.g., 2, 4, and 6) that conformed to some simple relational rule. Subjects were asked to discover that rule by generating triads of numbers and providing an explanation for why they chose those particular triads. Although the correct or optimal procedure would have been to generate sequences that were inconsistent as well as consistent with subjects' hypotheses, Wason found that they only generated triads that were consistent with their hypotheses.

In the context of this group-decision study, a similar process of information search could be found. In the consensus condition, for example, the pattern of group discussion clearly reveals a confirmatory bias in which group members did not search for information that was inconsistent with their prediscussion preferences. In the conflict and tie conditions, the conflicting prediscussion

preferences did promote a higher level of information search but the lack of overall pooling for nonpreferred alternatives still indicates an avoidance of disconfirming evidence.

There was a low level of pooling, with the exception of positive information for the preferred alternative (B), in the consensus condition. Thus, the lack of pooling reported by Stasser and Titus (1985) in their consensus condition was replicated despite what were perceived to be critical changes that would increase the possibility of information pooling (i.e., allowing group members to bring information to discussion). It would appear that when group members are consensually biased toward a nonoptimal decision alternative, there is very little that the resulting group discussion will do to correct this bias. However, it seems plausible that this type of group situation is highly unlikely to occur in groups outside the laboratory. That is, although groups often have unshared information, the distribution of prediscussion preferences is more likely to be similar to the conflict or tie conditions of this study rather than to the consensus condition. The results from the consensus condition might represent an error that can be demonstrated under laboratory conditions but this error has little relevance to real-life situations, a distinction that has been discussed by Funder (1987). Stasser and Titus (1985) pointed out that unshared information may be most prevalent in groups composed of members with differing areas

of expertise or with members representing special-interest populations. It seems unlikely that such group members would have identical preferences and more likely that they would have conflicting preferences for decision alternatives. This study suggests that the final group decision can greatly benefit from the resulting conflict.

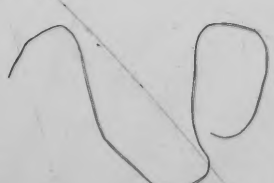
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Appendix A

House A (located in the Chiswell suburb)

Positive Features of House A

1. It is a ranch-style house (no basement or upper levels) so it is easier to heat and has better access for older or handicapped workers.
2. It has a well-equipped kitchen with many built-in appliances (e.g., dishwasher, microwave).
3. There is air-conditioning for hot, muggy days in the summer.
4. The house is heated by a gas-burning furnace, which is less expensive to maintain and operate than an oil-burning furnace.
5. It is located in a quiet neighborhood.
6. The house has a brick finish, which requires no maintenance or upkeep.
7. There is a study office or den for late night meetings or after-hours work.
8. There are two fireplaces in the house (one in the master bedroom and one in the living room).

Negative Features of House A

1. There is no garage for the company car.
2. The house is 40 minutes from work, which means higher transportation costs for the company.
3. The Chiswell suburb has a slightly higher-than-average property tax.
4. There is no summerdeck or patio in the backyard.
5. The house is 10-years old, which means slightly higher maintenance and upkeep costs.
6. The house is built on a large lot, which requires more maintenance and upkeep costs than a smaller lot.

Appendix B

House B (located in the Melberne suburb)

Positive Features of House B

1. The house is 5-years old, which means slightly less maintenance and upkeep costs.
2. There is a garage attached to the side of the house for the company car.
3. The house is 20 minutes from work, which means lower transportation costs for the company.
4. There is air-conditioning for hot, muggy days in summer.
5. There is a study office or den for late night meetings or after-hours work.
6. There is a patio off of the dining room.

Negative Features of House B

1. The house is built on a large lot, which requires more maintenance and upkeep costs than a smaller lot.
2. The house has a painted finish, which would have to be repainted every 5 years.
3. The Melberne suburb has a slightly higher-than-average property tax.
4. The kitchen is poorly equipped with no built-in appliances.
5. The house is heated by an oil-burning furnace, which is more expensive to maintain and operate than a gas-burning furnace.
6. The house is a split-level which is more expensive to heat and the stairs can be an inconvenience to older or handicapped workers.
7. The neighborhood is noisy (an often-used street runs close by).
8. There are no fireplaces in the house.

Appendix C

House C (located in the Solano suburb)

Positive Features of House C

1. It is located in a quiet neighborhood.
2. There is a study office or den for late night meetings or after-hours work.
3. The Solano suburb has slightly lower-than-average property tax.
4. The kitchen is well-equipped with many built-in appliances (e.g., a dishwasher, microwave).
5. The house is built on a small lot, which requires less maintenance and upkeep costs than a larger lot.
6. There is air-conditioning for hot, muggy days in summer.

Negative Features of House C

1. There is no garage for the company car.
2. The house is 35 minutes from work, which means higher transportation costs for the company.
3. The house is a split-level, which is more expensive to heat and the stairs can be a inconvenience to older or handicapped workers.
4. The house is heated by an oil-burning furnace, which is more expensive to maintain and operate than a gas-burning furnace.
5. The house has a wood finish, which would have to be restained every 5 years.
6. There is no summer deck or patio in the backyard.
7. There are no fireplaces in the house.
8. The house is 12-years old, which means slightly higher maintenance and upkeep costs.

Appendix D

The study you will participate in concerns group decision making. We want you to imagine yourself as a member of a 4-person committee directly responsible to the chairman of a large research corporation based in Toronto. Your chairman has recently sent you a letter asking the group to find a house for visiting personnel. Yesterday, you and the other members of the committee went out separately and evaluated three houses that are all in the same basic price range; later that evening you each drew up a list of the positive and negative items (those that you could remember) for each house. The group's task will be to decide which of the three houses best suits the needs of your company. Part of the reason for group discussion is that other members of the committee may have noticed (or missed) other aspects of a house that you might have missed (or noticed).

You will be given 15 minutes to read over the chairman's letter (on the next page) and to examine the descriptions for each house. You won't be allowed to take these descriptions into group discussion but you may jot down notes on the sheet of paper provided if you think it may help.

Before joining the other members of your committee, we would like for you to indicate which of the three houses you most prefer. There is a sheet provided in your booklet for this purpose.

Your group will be given 15 minutes to decide which of the three houses your company should purchase. The committee may not need the entire 15 minutes for discussion; one of the committee members can let the researcher know when the group has reached a decision. Your only constraint is that the group must decide upon one of the three houses.

If there are no questions, you may begin. Remember, read the chairman's letter over first, then the descriptions for each of the three houses (making notes if you wish) and then indicate which house you prefer. Please remain where you are until the researcher indicates to you that the rest of your committee members are ready to enter into discussion.

Appendix E

THE CANADIAN RESEARCH AND DEVELOPMENT CORPORATION
420 Dupont Street
Toronto, Ontario
M5C - 2Y5
(416) 555 - 0820

To: Chairman Assistance Group
From: Chairman of the Board

As you are undoubtedly aware of, our corporation brings in many consultants and specialists from all over North America to work on specific trouble areas and various short-term problems. These "trouble-shooters" often work closely with our company for anywhere from a couple of days to several weeks. Traditionally, the corporation has put them up in an apartment or a hotel; this policy, however, has become increasingly inconvenient and costly. In light of this, the board has voted in favor of purchasing a house. Not only will this be less expensive in the long run but our guests will be more comfortable and relaxed, which in turn can greatly benefit our corporation. The board has agreed to allocate \$200,000 to the purchase of a house; the committee's task, therefore, is to find something that matches our requirements.

The board has agreed that there are a couple of considerations that should be taken into account when evaluating houses. First, there are factors that minimize the cost of purchasing and maintaining a house over a long period of time. For instance, a house that is relatively new (e.g., 3 or 4 years old) will require less maintenance than a 25 year old house. Second, there are factors that can increase the attractiveness of a given house. For example, a fireplace, a study office, or a jacuzzi are all assets that add to the overall desirability of a house.

These are just some basic guidelines the committee should use when evaluating potential houses. I trust your group will use careful judgment in the purchase of a house.
Thank-you.

Sincerely yours,

Daniel D. Jones
Daniel D. Jones

DDJ/bt